CLAIMS

1. - A device for measuring the interaction of radiation with a material (3), comprising a primary radiation source (1), a device (2) for measuring the luminous intensity of the radiation that has interacted with the said material (3), the said device comprising a photomultiplier (4) equipped with a main window for entrance of the said radiation, an entrance photocathode disposed in the field of the said window, and a calibration source (5) designed to emit radiation of constant intensity oriented toward the said photocathode, the said device additionally comprising:

- means for turning off the radiation source (1) or for blocking the radiation to be measured,
- and means for activating the said calibration source (5) exclusively during the periods when the said radiation is turned off or blocked.

2. - A device according to claim 1, characterized in that it additionally comprises means for calculating the ratio of the measurement performed by the photomultiplier (4) subjected to the radiation to be measured during a period when this radiation is not turned off or blocked to the measurement performed by the photomultiplier (4) under the same conditions during a period when the calibration source (5) is activated.

3. - A device according to claim 1 or claim 2, characterized in that the said calibration source is an electroluminescent diode.

4. - A device according to claim 3, characterized in that the wavelength of the maximum emission intensity of the said diode falls within the wavelength region of maximum sensitivity of the said photomultiplier.

5. - A device according to any one of the preceding claims, characterized in that it comprises a scintillator element (8) disposed across the main entrance window and designed to convert the radiation to be measured to radiation of wavelength matched to

the sensitivity of the said photomultiplier, the calibration source emitting directly toward the said photocathode without passing through the scintillator element (8).

6. - A device according to any one of claims 1 to 5, characterized in that it additionally comprises means for disposing the said material (3) in the path of the radiation between the said primary source (1) and the said measuring device (2).

7. - A device according to claim 6, characterized in that the said primary source of radiation is an X-ray source.

8. - A device according to claim 7, characterized in that the said X-ray source is pulsed to ensure that the said source (1) is periodically turned off.

9. - A device according to claim 8, characterized in that the said pulsed source comprises an X-ray emission tube provided with a filament, an anode and a cathode, plus means for applying a high alternating voltage between the said anode and the said cathode.

10. A process for measuring the luminous intensity of radiation by means of the device according to any one of claims 1 to 9, wherein the radiation to be measured is measured, the radiation of the calibration source is measured, and the ratio of the measurement of the radiation to be measured to that of the radiation of the calibration source (5) is calculated.

11. A process for measuring the luminous intensity of radiation by means of the device (2) according to claim 10, characterized in that it comprises the successive stages in which:

- while the calibration source (5) is turned off or blocked, the intensity of the radiation to be measured is measured by means of the photomultiplier (4),
- thereafter, while the radiation to be measured is turned off or blocked, the

intensity of the radiation of the calibration source (5) is measured by means of the photomultiplier (4) maintained under the same adjustment conditions,

- and the final value of the intensity of the radiation is deduced by calculating the ratio of the measurement of the radiation to be measured to that of the radiation of the calibration source.

12. The use of the device according to any one of claims 1 to 8 or of the process according to any one of claims 9 to 10 for measuring the thickness of a material (3) interacting by absorption with the said radiation to be measured.